

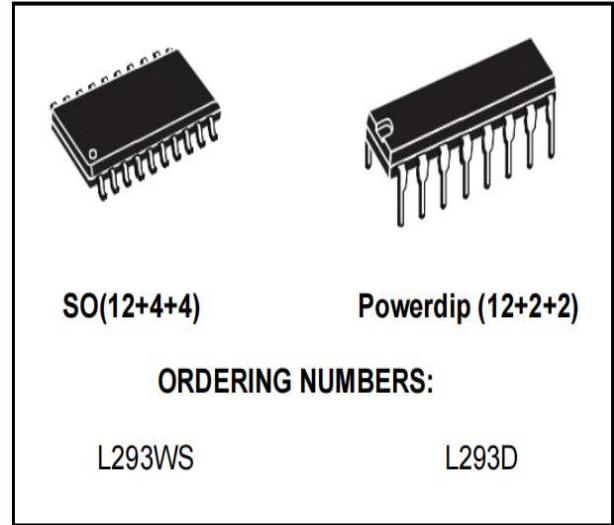
General Description

The Device is a monolithic integrated high volt-age, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads (such as relays solenoides, DC and stepping motors) and switching power transistors.

To simplify use as two bridges each pair of chan- nels is equipped with an enable input. A separate supply input is provided for the logic, allowing op- eration at a lower voltage and internal clamp di- odes are included.

This device is suitable for use in switching appli- cations at frequencies up to 5 kHz.

The L293D is assembled in a 16 lead plastic package which has 4 center pins connected to- gether and used for heatsinking The L293WS is assembled in a 20 lead surface mount which has 8 center pins connected to- gether and used for heatsinking.



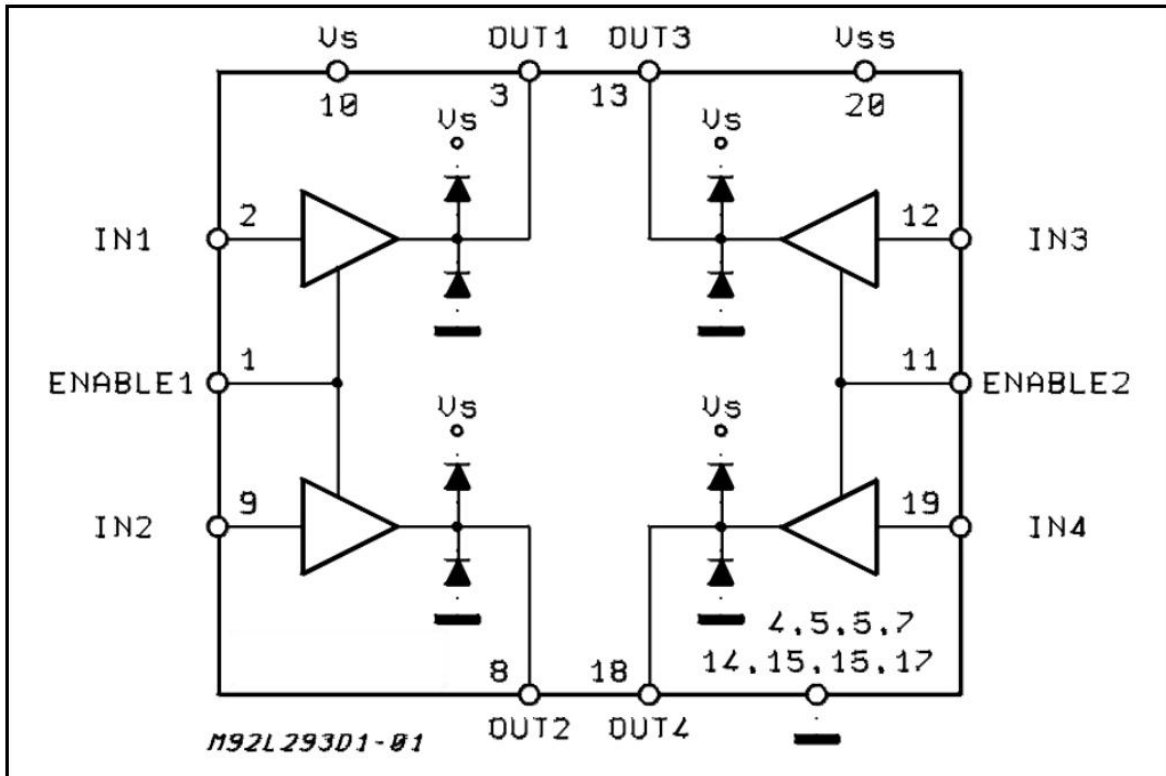
Features

- 600mA OUTPUT CURRENT CAPABILITY PER CHANNEL
- 1.2A PEAK OUTPUT CURRENT (non repetitive) PER CHANNEL
- ENABLE FACILITY
- OVERTEMPERATURE PROTECTION
- LOGICAL "0" INPUT VOLTAGE UP TO 1.5 V (HIGH NOISE IMMUNITY)
- INTERNAL CLAMP DIODES

ORDERING INFORMATION

DEVICE	Package Type	MARKING	Packing	Packing QTY
L293D	DIP-16	L293D	Tube	1000/Box
L293WS	SOP-20	L293WS	Tape	1000/Reel

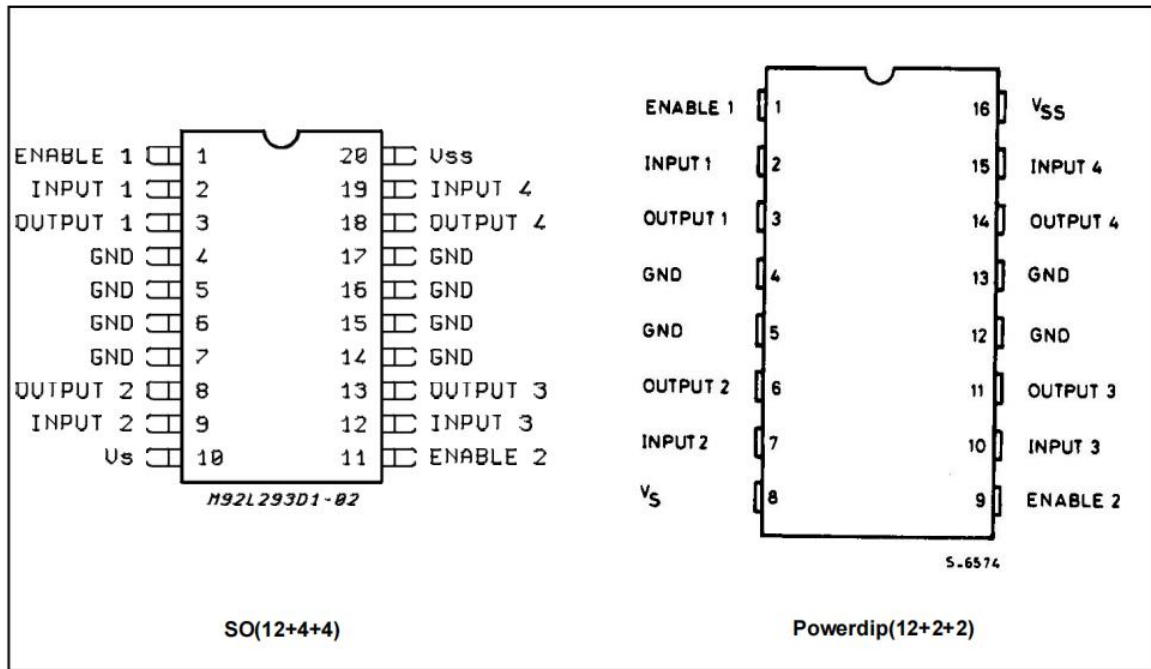
Block Diagram



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply Voltage	36	V
V_{ss}	Logic Supply Voltage	36	V
V_i	Input Voltage	7	V
V_{en}	Enable Voltage	7	V
I_o	Peak Output Current (100 μ s non repetitive)	1.2	A
P_{tot}	Total Power Dissipation at $T_{pins} = 90^\circ\text{C}$	4	W
T_{stg}, T_j	Storage and Junction Temperature	-40 to 150	$^\circ\text{C}$

PIN CONNECTIONS(Top view)



Thermal Data

Symbol	Description		DIP	SO	Unit
R _{thj-pins}	Thermal Resistance Junction-pins	max.	-	14	°C/W
R _{thj-amb}	Thermal Resistance junction-ambient	max.	80	50(*)	°C/W
R _{thj-case}	Thermal Resistance Junction-case	max.	14	-	

(*) With 6sq. cm on board heatsink.

Electrical Characteristics

(for each channel, $V_S=24V$, $V_{SS}=5V$, $T_{amb}=25^\circ C$, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_S	Supply Voltage (pin 10)		V_{SS}		36	V
V_{SS}	Logic Supply Voltage (pin 20)		4.5		36	V
I_S	Total Quiescent Supply Current (pin 10)	$V_i=L; I_o=0; V_{en}=H$		2	6	mA
		$V_i=H; I_o=0; V_{en}=H$		16	24	mA
		$V_{en}=L$			4	mA
I_{SS}	Total Quiescent Logic Supply Current (pin 20)	$V_i=L; I_o=0; V_{en}=H$		44	60	mA
		$V_i=H; I_o=0; V_{en}=H$		16	22	mA
		$V_{en}=L$		16	24	mA
V_{IL}	Input Low Voltage (pin 2,9,12,19)		-0.3		1.5	V
V_{IH}	Input High Voltage (pin 2, 9,12, 19)	$V_{SS} \leq 7V$	2.3		V_{SS}	V
		$V_{SS} > 7V$	2.3		7	V
I_{IL}	Low Voltage Input Current (pin 2,9,12,19)	$V_{IL} = 1.5V$			-10	μA
I_{IH}	High Voltage Input Current (pin 2,9,12,19)	$2.3V \leq V_{IH} \leq V_{SS}-0.6V$		30	100	μA
V_{enL}	Enable Low Voltage (pin 1,11)		-0.3		1.5	V
V_{enH}	Enable High Voltage (pin 1,11)	$V_{SS} \leq 7V$	2.3		V_{SS}	V
		$V_{SS} > 7V$	2.3		7	V
I_{enL}	Low Voltage Enable Current (pin 1,11)	$V_{enL} = 1.5V$		-30	-100	μA
I_{enH}	High Voltage Enable Current (pin 1,11)	$2.3V \leq V_{enH} \leq V_{SS}-0.6V$			± 10	μA
$V_{CE(sat)H}$	Source Output Saturation Voltage (pins 3, 8,13,18)	$I_o = -0.6A$		1.4	1.8	V
$V_{CE(sat)L}$	Sink Output Saturation Voltage (pins 3, 8,13, 18)	$I_o = +0.6A$		1.2	1.8	V
V_F	Clamp Diode Forward Voltage	$I_o = 600nA$		1.3		V
t_r	Rise Time(*)	0.1 to $0.9 V_o$		250		ns
t_f	Fall Time(*)	0.9 to $0.1 V_o$		250		ns
t_{on}	Turn-on Delay(*)	$0.5 V_i$ to $0.5 V_o$		750		ns
t_{off}	Turn-off Delay(*)	$0.5 V_i$ to $0.5 V_o$		200		ns

(*) See fig. 1.

Truth Table(one channel)

Input	Enable(*)	Output
H	H	H
L	H	L
H	L	Z
L	L	Z

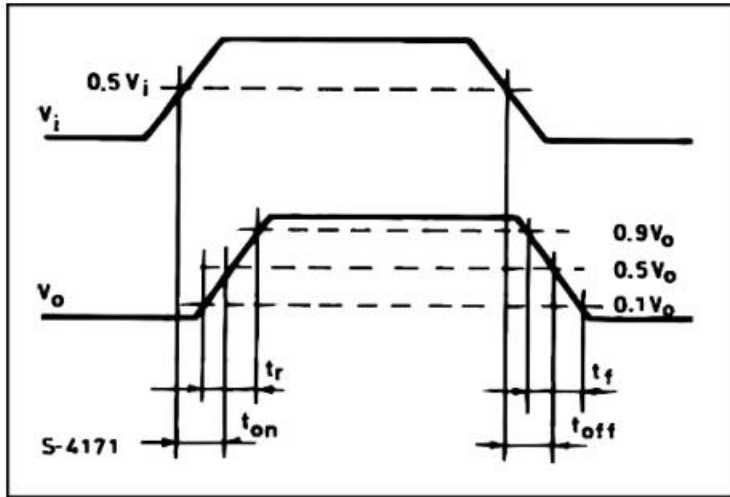


Figure 1: Switching Times

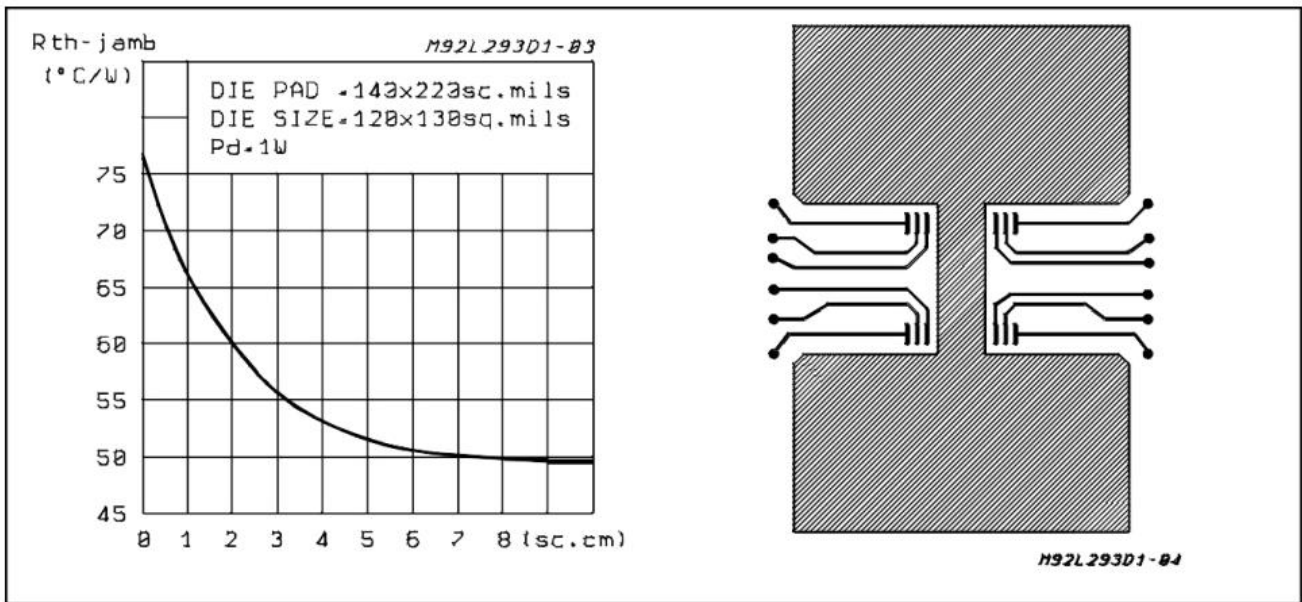
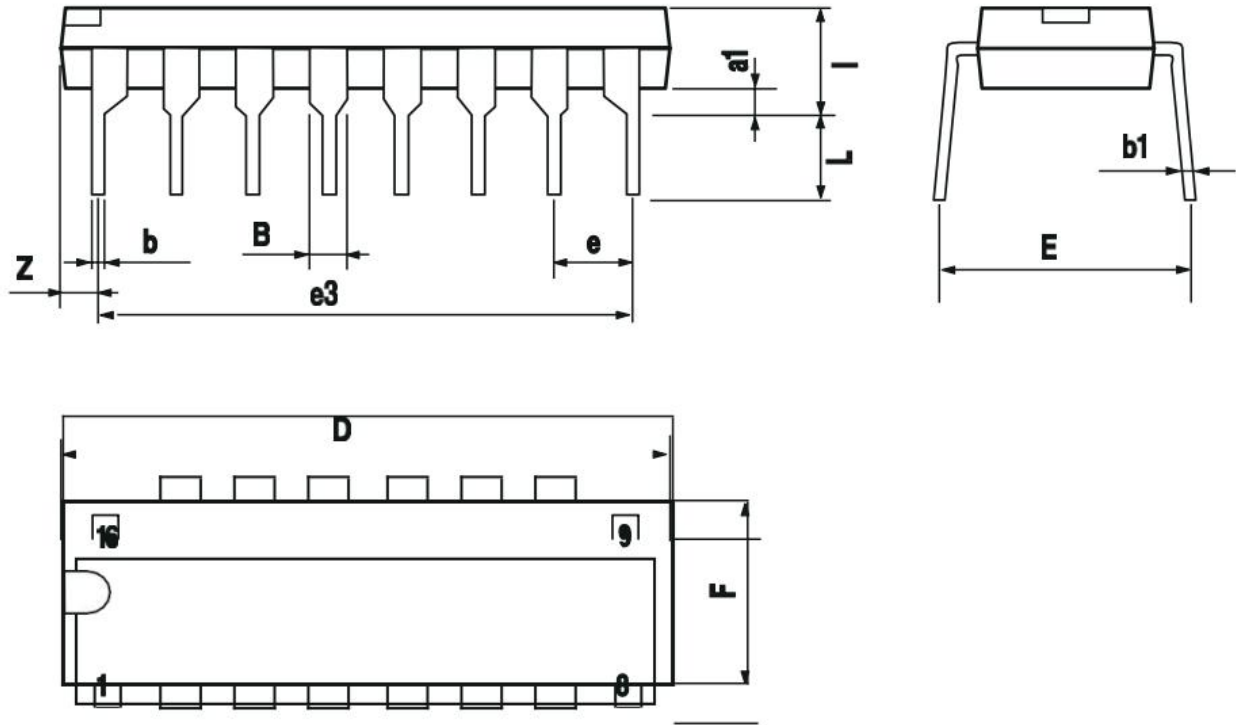


Figure 2: Junction to ambient thermal resistance vs. area on board heatsink (SO12+4+4 package)

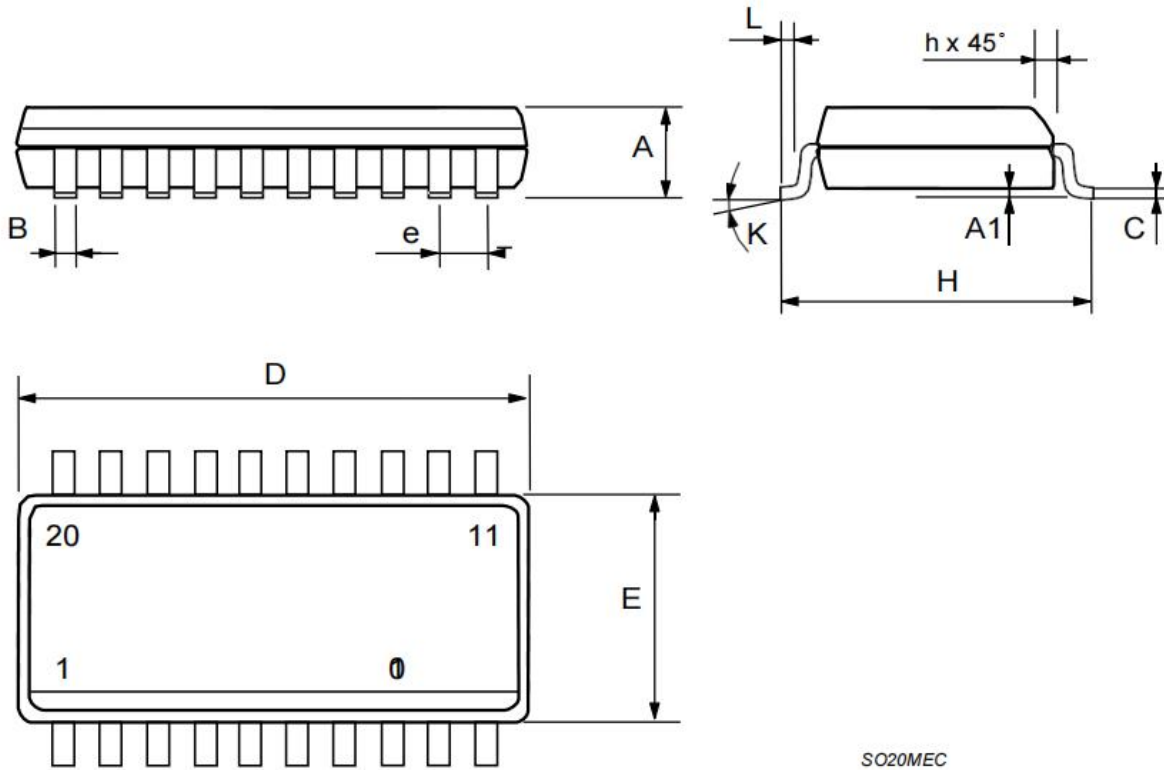
Package Information

Powerdip 16



DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.85		1.40	0.033		0.055
b		0.50			0.020	
b1	0.38		0.50	0.015		0.020
D			20.0			0.787
E		8.80			0.346	
e		2.54			0.100	
e3		17.78			0.700	
F			7.10			0.280
I			5.10			0.201
L		3.30			0.130	
Z			1.27			0.050

SO20



DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.35		2.65	0.093		0.104
A1	0.1		0.3	0.004		0.012
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	12.6		13	0.496		0.512
E	7.4		7.6	0.291		0.299
e		1.27			0.050	
H	10		10.65	0.394		0.419
h	0.25		0.75	0.010		0.030
L	0.4		1.27	0.016		0.050
K	0°(min.)8°(max.)					

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